



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,989	04/01/2004	Ju-Cheol Shin	2522-055	2017

20575 7590 06/09/2006

MARGER JOHNSON & MCCOLLOM, P.C.
210 SW MORRISON STREET, SUITE 400
PORTLAND, OR 97204

EXAMINER

LEE, CALVIN

ART UNIT	PAPER NUMBER
----------	--------------

2818

DATE MAILED: 06/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/816,989

Applicant(s)

SHIN et al.

Examiner

Lee, Calvin

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2006 (Amendment).
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-6 and 8-13 is/are allowed.
- 6) ☒ Claim(s) 14-19 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

FINAL ACTION

Response to Amendment

1. The amendment of claims 1 & 8, the cancellation of claim 7, and the addition of claims 14-20 in Paper dated May 1, 2006 are acknowledged.

Claim Rejections - 35 U.S.C. § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Akasaka et al* (US 6,893,980) in view of *Hashimoto et al* (US 6,022,586).

a) In re claims 14 and 18, *Akasaka et al* (US 6,893,980) discloses a method of manufacturing a semiconductor device, comprising the steps of:

- forming a tungsten layer pattern having an oxidized surface on a substrate [col. 7];
- introducing a source gas including silicon (e.g., SiH_2Cl_2 , SiH_4 found in col. 7) into the oxidized surface of the tungsten layer pattern to form a protecting layer 20 [col. 8];
- thermally treating the substrate [step 5 in col. 9]

Akasaka et al teaches forming the protecting layer to prevent the damage of the surface of the tungsten oxide film, but not “to prevent an abnormal growth of oxide contained in the oxidized surface of the tungsten layer pattern.” The functional recitation “to prevent an abnormal growth of oxide...” has not been given patentable weight because it is narrative in form unless it must be expressed as a “means” for performing the specified function, as set forth in 35 USC 112, 6th paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language. *In re Fuller*, 1929 CD 172, 388 O.G. 279.

In addition, *Hashimoto et al* (US 6,022,586) discloses introducing silane gas for allowing silicon to be deposited on the surface of the tungsten silicide [col. 10, ln.38].

b) In re claims 15-16, *Akasaka et al* also discloses forming on the oxidized surface of the tungsten layer a tungsten oxide layer formed by pressure CVD or plasma CVD [col. 7, ln.7].

c) In re claim 17, *Akasaka et al* suggests forming protecting layer, comprising the steps of:
-maintaining a temperature of the substrate in a range of 550° to 780°C [Fig. 2];
-introducing a silane gas onto the oxidized surface of the tungsten layer to react with the oxidized surface [col. 7, ln.33].

Akasaka et al does not suggest the flow rate of the silane gas. Note that the specification contains no disclosure of either the critical nature of the claimed flow rate of any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 16 USPQ 2d 1934, 1936 (Fed. Cir. 1990).

d) In re claim 19, *Akasaka et al* suggests the protecting layer having a thickness of 100nm [col. 7, ln.2], but not about 1 Å to about 100 Å.

It would have been an obvious matter of design choice to have the claimed layer thickness (closely suggested by *Akasaka et al*), since such a modification would have involved a mere change in the size of an isolation structure. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Allowable Subject Matter

4. Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim because neither *Akasaka et al* nor *Hashimoto et al* discloses implanting silicon ions to the oxidized surface of the tungsten layer. Claims 1-6 & 8-13 are allowed for the same reason.

Response to Argument

5. Applicant's argument that "the combination of *APA* and *Akasaka et al* fails to establish *prima facie* obviousness for claim 8" is persuasive, because claim 8, as well as claim 1, has been amended with the allowed subject matter of claim 7.

However, the Examiner found out that the new claims 14-19 disclosing no such subject matter. Therefore, claims 14-19 are rejected under *Akasaka et al* in view of *Hashimoto et al*. Please see the above rejection for further details.

6. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire three months from the mailing date of this action. In the event a first reply is filed within two months of the mailing date of this final action and the advisory action is not mailed until after the end of the three-month shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than six months from the date of this final action.

Contact Information

7. Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at (571) 272-1896 on Mondays thru Thursdays 6:30-4:30PM. If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2818's Supervisory Patent Examiner *Matthew Smith* can be reached at (571) 272-1907. The fax phone number for the organization (where this application is assigned to) is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system at <http://pair-direct.uspto.gov> Should you have questions on access to the PAIR system, contact the Electronic Business Center at (866) 217-9197.

C

Dated: May 31, 2006

Calvin Lee

Andy Huynh
ANDY HUYNH
PRIMARY EXAMINER